

1 (August 4, 2003)

2 **Membrane Waterproofing System A Membrane**

3 The membrane shall be factory-laminated sheet composed of either suitably  
4 plasticized coal tar or rubberized asphalt reinforced with polypropylene fabric or  
5 added polyester fibers. It shall be manufactured free from blemishes,  
6 discontinuities, and other defects. The membrane shall be supplied in rolls, having  
7 a minimum width of 36 inches, and shall conform to the following requirements:

8  
9 Thickness: 65 mils minimum  
10 Pliability (1): No cracks

- 11  
12 (1) Place a 4 inch by 1 inch membrane specimen in a -10F cold chamber for  
13 two hours. While still in the cold chamber, bend the specimen 180  
14 degrees over a 1 inch radius mandrel. Remove specimen from cold  
15 chamber and inspect for cracks.  
16

17 **Membrane Waterproofing System B Membrane**

18 The membrane shall meet the following requirements:

19  
20 Viscosity, SSF at 350F ASTM E 102 950-1350  
21 Softening Point, F ASTM D 36 165 Min.  
22 Adhesion, psi ASTM D 429(1) 15 Min.  
23 Cold Bend Test, at -10F (2) No cracks  
24 Compatibility with Asphalt Complete  
25

- 26 (1) Adhesion ASTM D 429, Method A(Modified). The Contractor shall  
27 perform the following tension test of vulcanized rubber bonded to steel:  
28

29 Coat the surfaces of the 2 metal plates described in the procedure  
30 with an epoxy resin of at least 2000 psi tensile strength. Stand the  
31 coated ends on Ottawa sand (ASTM C 109). Apply a force of 10  
32 pounds for a minimum of eight hours to ensure adequate bedding of  
33 the sand in the resin. Brush all loose particles from the treated metal  
34 surface and coat each with 0.0106 ounces of primer.  
35

36 Cover the bottom of a cylindrical thin film oven test pan (ASTM D  
37 1754) with a release paper such as Technipeel No. 985 made by the  
38 Brown Paper Company of Kalamazoo, Michigan. Any release paper  
39 that retains its release properties after use is satisfactory.  
40

41 Pour 1.75 ounces of membrane (at 350 to 375F) into the release-  
42 treated pan. Allow the membrane to cool to ambient temperature.  
43 Remove it from the pan and cut circular sections to fit the metal plates  
44 or discs coated as above.  
45

46 Fit the circular section of membrane on one metal disc and place the  
47 other metal disc over it. Put this sandwich in a 140F oven. Place a  
48 2.205 pound weight on it and leave in the oven for two hours.  
49

50 Test in accordance with ASTM D 429, Method A, and calculate  
51 adhesion as total load at failure divided by area of adhered surface,

whether failure occurred at bonded surface or within the membrane material.

(2) Cold Bend Test. The Contractor shall perform the following test:

Pour 1.75 ounces of membrane into a container, as described for the adhesion test. Allow it to cool to ambient temperature and remove from the pan.

Dust both sides lightly with talc to prevent stickiness.

Place the specimen in a -10F cold chamber for two hours. While still in the cold chamber, bend the specimen 180 degrees over a radius not to exceed 1 inch.

Remove the membrane from the cold chamber and check for cracks. Only material which shows no cracks will be considered satisfactory.

## Membrane Waterproofing System C Fabric For Membrane Protection

The fabric shall be a polypropylene material having the following properties:

Tensile strength, either direction, min. 47 lbs. (WSDOT Test Method 916)

Weight, oz./sq. yd. 3-6

Width, inches 36 min.